with spatial resolution of 250 m that enables measurements even for small estuaries. Landsat observations (from 1984 to present), using combined satellite measurements from the MODIS Approach suspended solids, and water clarity are needed to establish reference conditions and to quantify temporally resolved measurements of chlorophyll. The Gulf of Mexico Alliance, an organization fostering collaboration between the Gulf States and criteria to protect designated uses from effects of nutrients. This is largely due to the absence of Water quality standards in the U.S. consist of:

1. Designated uses (the services that a water body provides; e.g., drinking water, aquatic life, recreation, etc.)
2. Criteria to protect designated uses from effects of nutrients.

For estuaries and coastal waters in the Gulf of Mexico, there are no numeric (quantitative) criteria to protect designated uses.

MODIS Products
Three series of water clarity parameters are created from the Level 3 MODIS data products obtained from the MODIS Adaptive Data Processing System (MODADS) and the Atmosphere Archive and Distributions System (MODADAS). The Level 3 calibrated radiance products are processed using the SeaDAS software (developed and maintained by the GSFC Ocean Biology Processing Group) to apply atmospheric correction (based on SWIR and NIR bands) and to retrieve inherent optical properties (IOP) of coastal and estuarine waters. Based on quality flags generated for each pixel, water clarity parameters are not produced for pixels that are identified as (1) land, (2) cloud and/or ice, (3) affected by severe sun glint, and (4) acquired at high solar zenith angle. The following IOPs are retrieved using the QUAIC Algorithm and are used to produce the water clarity parameters using the formulae shown below:

1. Total absorption coefficient at 443 nm, \(a_{443}\)
2. Total backscattering coefficient at 469 nm and 555 nm, \(b_{469}\) and \(b_{555}\)
3. Gelbstoff absorption coefficient at 555 nm, \(a_{gelbstoff}\)
4. Diffuse attenuation coefficient for the photosynthetically active radiation, \(K_{down}\)

Chlorophyll concentration:

1. \(K_{down} = a_{555}/a_{443}\)

Atmospheric correction:

1. \(a_{ext} = a_{back} + a_{abs}\)

Light attenuation by Chl (dotted line):